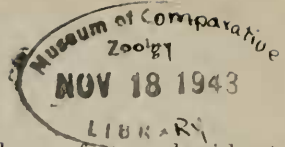


## ALDER v. BIRCH.

By P. B. M. ALLAN.

13,820



Is alder one of nature's substitutes for birch, so far as lepidoptera are concerned? That is a question which I have been asking myself more and more often of late. For alder is one of my disappointments in life. I *ought* to find all manner of good things feeding on its rather ugly leaves; it is meet that I should disinter *furcifer*a in scores, each August, from the earth and debris at its roots. But I never do. For years and years I have searched alder, from Essex to Cardigan Bay, and never yet have I found anything pleasant upon it but the ubiquitous *papilionaria* and *dromedarius*, and a few small geometers. The text-books inform me that practically every lepidopterous larva which is worth finding is to be found on alder, and who am I that I should cast doubt upon their assertions? Why, then, do the *optima bona*, the entomological gems of "purest ray serene," avoid me? 'Tis true I once found (dear me, how many years ago it was! May 19th, so my diaries say) the alder stumps in Pamber Forest well tenanted by *sphéciformis*; but that was only the exception which serves to emphasize my belief. Perhaps rows of houses cover those stumps to-day, even as they do the stubble field whereon I shot my first partridge. Maybe it is this boyhood recollection that induces me to go on searching alder year after year. But never again have I found *sphéciformis*, and ever my quest for *bicuspis* continues unavailing.

In the north of England and in Scotland, my friends tell me, the case is otherwise; alder is one of the most fertile of trees to the lepidopterist. If this be so, why should some species eschew, in the South, a food-plant which they cleave to in the North? I am coming more and more to the conclusion that, so far as the South and Midlands are concerned, alder is gradually being given up, as a foodplant, by many species which formerly used it freely. For with the exceptions of *bicuspis* and *furcifer*a and one or two of the geometers which I have never taken, I have found on birch almost every species which the textbooks list as alder-eaters. I will even go so far as to say that I have never yet found on alder a species which I could not have taken more commonly and more profusely on birch.

The pedigrees of these two plants are interesting. Birch is much the older. It seems to have appeared in this country during the *pre-boreal* period, during which the climate gradually changed from arctic to subarctic, and the vegetation, at first tundra (I quote Dr Leach), gradually passed over into birch forest, with abundant willows, and pines appeared. This period was succeeded by the *boreal*, in which the climate was continental in character, being warm and dry, and our island was dominated by forests of pine and birch. It was during this period that alder put in an appearance. Hazel also came on the scene at this time, and hazel is a reputed foodplant of both *papilionaria* and *dromedarius*; indeed, the vegetation of our island during the first half of the boreal period seems to have been characterized "by the extensive occurrence of dense, more or less pure, hazel forest" (Leach, 1933). In its turn the hazel forest rapidly degenerated, probably owing to climatic changes. Then, as the climate altered to the warm moist

oceanic type of the *Atlantic* period, the alder became predominant, and oak forest largely replaced the pine and birch.

I have never found either *papilionaria* or *dromedarius* on hazel, though both moths and all three foodplants are plentiful in Montgomeryshire and I have searched hazel industriously these last three years. Often it grows alongside the birch and alder on which I find these two moths. Possibly hazel—in this district—is evolving on lines that are gradually rendering it unsuitable as a foodplant for these species. It is of interest to note in passing that in spite of the long list of macro-lepidoptera reputed to feed on hazel, the only species which I have found on it here in Wales are *Orgyia antiqua* L. and *Calocasia (Demas) coryli*, L.

Is it possible that birch was the original foodplant of most, if not all, Lepidoptera whose larvae are to be found on alder to-day? Quite possible, I should say; but such a premise is of no value. Recent research has shown that many larvae can adapt themselves to a new foodplant very quickly indeed, sometimes in the course of a mere generation or two. (See Imms: *Recent Advances*, 1937, Chap. XI.) So long ago as 1911 Pictet found that when larvae of *Lasiocampa quercus* were given pine only, a percentage of them adopted the new food and that in the next generation (bred from these adventurers) the larvae preferred pine to all other food. Moreover, "there is considerable evidence in favour of the contention that . . . polyphagy is phylogenetically the older habit, oligophagy and monophagy being more recent developments" (Imms, *ibid.*, p. 298). Perhaps *papilionaria* and *dromedarius* had an even wider range of foodplants in days gone by—there are records of *papilionaria* being found on beech and broom—and are becoming more selective. In the case of those other species which, the textbooks tell me, I ought to find on alder but do not, I can only conclude that so far as their southern and perhaps midland races are concerned they are now "out of tune" with alder physiologically.

Those pioneers which lay their eggs on alder, though come of a birch-eating race, may beget an alder-eating race. R. N. Chapman (1931) has suggested that there may be, thereafter, a selective action of the *environment* in eliminating all the progeny which have a tendency to choose other host plants than those upon which they hatch, and this would lead to the progeny choosing again the same host plant. Thorpe (1929) concluded from biological and genetic evidence that there may be two or more biological races within a single species, each race selecting a particular foodplant. My own observations *in the field* tend to confirm this so far as *papilionaria* and *dromedarius* are concerned. Here in Wales I find the former only on alder in the valleys of the Severn and its tributaries, and only on birch on the hillsides and higher ground, though there is plenty of alder on the hillsides, while birch often grows alongside alder in the valleys. *Dromedarius* shows the same "local preferences," though I have found one exception. Yet my larva cages afford no confirmation; for it has been my experience, so far, that these alder-eating *papilionaria* and *dromedarius*, if given no alder, will complete their growth upon birch, and vice versa. Not yet have I come across a larva, of either species, which will starve rather than adopt the alternative foodplant.

A moth is said to recognize by scent the correct plant for oviposition, so perhaps chemotropism is here concerned; it may be a matter of the size of the molecules of the scent, natural selection weeding out individuals whose receptors can appreciate the scent of *both* birch and alder, allowing only those whose receptors are the more selective (*i.e.*, appreciative only of birch) to survive. For it is likely that a moth's perception of scents is limited to those concerned with (*a*) food, (*b*) mating, (*c*) ovipositing; all the evidence goes to show that an insect can appreciate only those scents and sounds which are necessary to, or inimical to, or in some way affect, its well-being. There is no reason why a moth should be able to appreciate all the scents and sounds of the countryside (and town) which are discernible by us. Anthropomorphism is a treacherous bog where insects are concerned. On the other hand, for the life of me I cannot suggest any reason why selection should operate in favour of birch in a southern latitude only unless it be, as I have suggested, that here in the South and Midlands alder is gradually becoming less suitable physiologically.

Is it true that *furcifera* has been found feeding on birch as well as alder? Of the textbooks to which I have access in my war-time abode St John alone gives birch as a foodplant of this species, quoting Newman as his authority. But those who visit Glamorganshire annually for this species should be able to enlighten me. And has nobody ever found on birch the larvae of two geometers which, these same authorities tell me, feed on alder alone—to wit *Hydriomena coerulea*, Fab. (*impluviata*, Hb.) and *Euchoeca nebulata*, Scop. (*obliterata*, Hufn.)? Yet if no record of these species on birch were forthcoming it would not upset me; for I should suggest that the original birch-eating race had died out. Aberhafesp, Newtown, Mont:

---

### ON THE TRAIL OF MELITAEA ARCESIA.

By E. P. WILTSHIRE, F.R.E.S.

(I find my previous contributions to the *Entomologist's Record* have been, some rather dry and others rather turgid. To make amends, if I can, to long-suffering readers, I offer the following extract from my diary of my six-weeks' holiday in the Kashmir in May-June 1942. It is hoped that the full account of this expedition will eventually appear in the *Journal of the Bombay Natural History Society*, but this must await the complete determination of the material collected.)

Next morning, 17th June, we walked down to Taobat and then turned right, up the wide torrent which there enters the Kishenganga. Not only was this walk the furthest point from Srinagar to which we penetrated on our trek, but it was, to me, at least, the climax. Coming from Persia, of which country the pretty and puzzling Fritillary butterflies of the genus *Melitaea* are the crowning glory, I had kept a special look-out for them in Kashmir; *arcesia*, Bremer was the only species recorded from here, but, being only known from Central Asia, was a great prize. The only clue I had to its habitat was Colonel Home's laconic record from, I think, Sonamarg: "one only, 8000 ft., May." It was now mid-June and my hopes of finding *arcesia* were very low, especially since I fancied I was at too low an altitude for it. But to